

Wrap-around

=Abstract=

Finger Reconstruction with a Free Neurovascular Wrap-around Flap from the Big Toe

Soo Bong Hahn, M.D., Hong Jun Park, M.D.,
Ho Jung Kang, M.D., and Eung Shick Kang, M.D.

Department of Orthopaedic Surgery, Yonsei University College of Medicine, Seoul, Korea

From 1983 to 1998, 16 cases of finger reconstruction with a free neurovascular wrap-around flap from big toe were performed. Fourteen cases were successful and excellent functional and cosmetic results were achieved. Pinch power was 51% of unaffected normal hand and two-point discrimination was 9.2mm. The bone resorption was 13% of the initial bone graft width and 9% of that in length. There were no complications such as fracture of grafted bone, nonunion, pulp dislodgement. This procedure provided length, stability and adequate sensibility for a functional pinch and grasp. The sensory return to wrap-around flap on the thumb is often greater than for the same area on the opposite foot. The donor site of the wrap-around flap is acceptable esthetically and functionally in open-toed shoe styles worn by young woman. Finger reconstruction with a wrap-around flap from the big toe gives excellent cosmetic and functional results in cases of amputation at the level of the metacarpo-phalangeal joints or distal to it. In addition, in cases of the avulsion injuries of fingers and reconstruction of soft tissue defect after tumor excision, this procedure could be an excellent choice of treatment.

Key Words : Finger reconstruction, Wrap-around flap

※ :

1.

가 1983 1998
wrap-around
16

가 , , 38

13 14 2 2 16

1980 가 14 ,
Wrap- 가 1 .

Morrison 17)
around 가

가 14 ,
가 2 가 ,

11 ,

1 ,

5 , 11

(Table 1).

Table 1. Data on 16 Cases of Wrap-around Flaps

Case	Sex	Age	Injured Finger	Level of Amputation	Cause of Injury	Result	Two-Point Discrimination
1	M	23	Lt. Thumb	Skin	Press Machine injury	SUCCESS	13mm
2	M	31	Rt. Index	Skin	Roller Machine injury	SUCCESS	32mm
3	M	18	Lt. Thumb	PP*	Rock Drill injury	SUCCESS	11mm
4	M	25	Rt. Thumb	DP [†]	Splinter of a Tear Shell	SUCCESS	7mm
5	M	25	Rt. Thumb	PP*	Press Machine injury	SUCCESS	4mm
6	M	24	Rt. Thumb	PP*	Press Machine injury	SUCCESS	6mm
7	F	24	Rt. Ring	DIP [‡]	Avulsion by Car Door	FAILURE	NA
8	M	25	Lt. Thumb	PP*	Press Machine injury	FAILURE	NA
9	M	21	Lt. Thumb	DP [†]	Cutting Machine injury	SUCCESS	4mm
10	M	21	Rt. Thumb	PP*	Cutting Machine injury	SUCCESS	4mm
11	M	24	Rt. Thumb	PP*	Press Machine injury	SUCCESS	6mm
12	M	29	Lt. Thumb	Skin	Grinder Machine injury	SUCCESS	7mm
13	M	46	Rt. Thumb	Skin	Malignant Melanoma	SUCCESS	7mm
14	F	41	Lt. Thumb	Skin	Malignant Melanoma	SUCCESS	NA
15	M	37	Rt. Thumb	PP*	Electric Burn injury	SUCCESS	NA
16	M	21	Rt. Index	MP [§]	Press Machine injury	SUCCESS	NA

*, Proximal Phalanx ; †, Distal Phalanx; ‡, Distal Inter-Phalangeal joint; §, Middle Phalanx; , Not Available

2.

(dorsalis pedis artery)
 (posterior tibial artery)
 1 (first dorsal metatarsal artery) 2
 . (deep plantar artery) 1 (first plantar metatarsal artery)
 (plantar digital artery) 1
 Gilbert
 78% 가 1
 (first dorsal interosseous muscle)
 , 22%
 9) (Fig. 1).

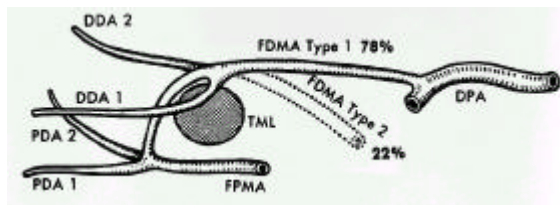


Fig. 1. The first dorsal metatarsal artery (FDMA) could be found to lie superficial to or just within the substance of the 1st dorsal interosseous muscle in 78% to 88% of feet.

1
 ,
 1
 (venae comitantes)
 (greater saphenous vein)
 1
 (deep peroneal nerve)가
 (medial plantar nerve)
 (plantar digital nerve)

(anatomical snuff box) , 1
 (first dorsal interosseous muscle)
 (adductor pollicis muscle)
 (princeps pollicis: first palmar metacarpal artery) . (cephalic vein)
 (superficial radial nerve) .



Fig. 2. Flap design of donor site is same as that of Morrison et al.

3.

Morrison ¹⁷⁾
 . ,
 (Fig. 2).
 , (anatomical snuff box) 가
 , (princeps pollicis artery) ,
 . ,
 , 가 1
 .
 (germinal matrix)
 가



Fig. 3. Dissection of deep peroneal nerve and donor vascular bundles is performed.

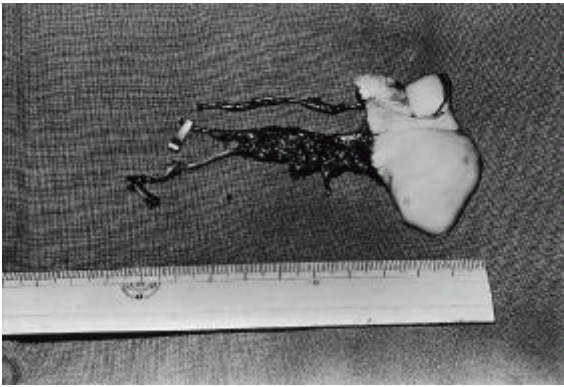


Fig. 4. Flap with neurovascular pedicle.

1
(Fig.
3). 가 ,
가 . 1
1
, 가
(paratenon of
extensor hallucis longus)

(Fig.

4). ,
가
, (pulp)
,
,
(Fig. 5).
가 1cm
,
(cross toe flap)

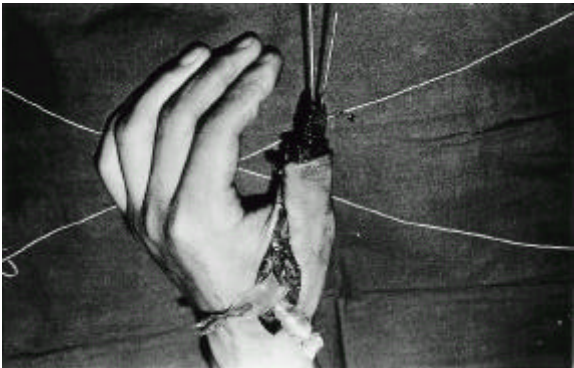


Fig. 5. Iliac bone graft pinned to the base of distal phalanx of thumb and anastomoses of neurovascular bundle completed.

4. 가
(pinch power)
(two point discrimination)
가
,
가
14 가 2 ,
6.5cm , 27 (18 46)
51% ,

Table 2. Complications.

Complication	No. of Cases	Comment / Treatment
Vascular failure	2	Groin tubular flap
Partial skin necrosis	2	Debridement and Skin graft
Raynauds syndrome	1	Cold sensitivity

A

B

Fig. 6. A. Preoperative appearance of left hand. B, C. Preoperative AP and lateral radiograph of left thumb which was amputated at the distal phalanx level.

C

가 11 9.2mm
(Table 1).
13%, 9% . 21
, , 2 ,
가 , 가
, 1 , 2, 3 가
(Table 2). , 가 .

C

(Fig.

14

0

55 °

가

,

4 mm

(Fig. 6- A, B, C).

1

가

가

1 x 1 x 2 cm

, K

(Fig. 8-A, B, C, D, E, F).

가

1

Fig. 8. A, B, C. The ranges of flexion, extension and abduction motion of the reconstructed thumb are normal respectively. D, E. Postoperative 14 months radiograph shows bone resorption slightly. F. Donor site appearance shows minimal morbidity 14 months postoperatively.

(staged pedicle graft)

가

가

1-6).

7, 13) . , Falconer²³⁾
 (pollicization)¹⁰⁾, 가 가
 1960 , ,
 가 . 1969
 Cobbett⁶⁾ (free snuff-box flap) , (free
 peroneal flap)
 가 11, 21)
 Morrison , 가
 가 ,
 , ,
 가 가²⁰⁾ , Lowdon¹⁶⁾
 , 가
 2 , ,
 2 , , Doi⁸⁾
 19)²⁾
 1980 Morrison¹⁷⁾
 wrap
 -around , ,
 , ,
 51%
 ,
 13%, 9%
 wrap-around
 8, 18, 23)
 Nunley¹⁸⁾ Morrison Aziz²²⁾ Koshima¹⁴⁾ 2 T sai
 wrap-around
 , Doi⁸⁾ wrap-around
 가 , 가 ,
 , , ,
 . T sai 가 ,

가
Wrap-around
(interphalangeal joint)
가
(metacar-
pophalangeal joint)
2
wrap-around
2
가
1
wrap-around
가
1)
18(6) : 1155- 1164, 1983.
2)
24(5) : 1456- 1464, 1989.
3)
Technique
23(4) : 1158- 1164, 1988.
4)
Wrap-around

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Wrap-around
Flap
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